Influenza

Overview[1,2]

For a complete description of influenza, refer to the following texts:

- Control of Communicable Diseases Manual (CCDM).
- Red Book, Report of the Committee on Infectious Diseases.

Case Definition[3]

Clinical description
Influenza is an acute viral disease of the respiratory tract characterized by abrupt onset of fever, myalgia, headache, severe malaise, nonproductive cough, sore throat and rhinitis. Without laboratory confirmation, influenza is referred to as "influenza-like illness" (ILI)

Clinical case definition
Without laboratory confirmation, the ILI case definition used by CDC for national surveillance is fever $\geq 100^0$ Fahrenheit or 37.8^0 Celsius **and** cough and/or sore throat (in the absence of a known cause). Influenza is commonly recognized by epidemiologic characteristics. Influenza illness may be indistinguishable from other viral respiratory illnesses based on symptoms alone.

Laboratory criteria for diagnosis

- Virus isolation by cell culture
- CLIA certified laboratory Immunofluorescence, Influenza Enzyme Immuno Assay (EIA), or Reverse transcription-polymerase chain reaction (RT-PCR[5])
- CLIA waived Commercial rapid non-culture diagnostic tests for influenza virus
- *Four-fold rise in antibody titer between the acute and convalescent serum specimens.

Case classification
*Confirmed***:** a case that is laboratory confirmed by virus culture, rapid diagnostic tests, or a four-fold rise in antibody titer between the acute and convalescent serum.

* Note: Serology tests available from reference laboratories that rely on the results of a **single** acute serum specimen**, are not be considered confirmatory**.

Information Needed for Investigation

Verify the diagnosis. What laboratory tests were conducted? What were the results? What are the case's clinical symptoms?
Establish the extent of illness. If the patient works outside the home, attends school or childcare, or resides in a health care facility, determine if co-workers, schoolmates, other patients, or family members have been ill with the same set of symptoms. This can be done by questioning the patient, the patient's family, the school or childcare facility, or the health care facility management.
Contact the Regional Communicable Disease Coordinator when an outbreak is suspected, or when cases are in high-risk settings such as health care facilities or among the children or employees of child care centers.
Contact Bureau of Child Care when cases are associated with childcare facilities at 573-751-2450.
Contact Long Term Care Regulation of Senior Services and Regulation when cases are associated with Long Term Care facilities at 573-526-8570.

Case/Contact Follow Up And Control Measures

Determine the basis of the diagnosis. If the case is the first confirmed case of the influenza season or a suspected outbreak, call or fax this information to the Regional Communicable Disease Coordinator or the State Influenza Coordinator.

If an outbreak is reported at a school, hospital, nursing home, or other group setting, and the facility is unable to arrange for rapid diagnostic influenza testing, contact the Regional Communicable Disease Coordinator or the State Influenza Coordinator to arrange for viral culture kits from the Missouri State Public Health Laboratory (SPHL). Instruct the facility to properly collect throat swabs of symptomatic patients, residents or staff, and send the specimens to the SPHL for virus culture testing and strain identification.

Control Measures
See the Influenza section of the Control of Communicable Diseases Manual (CCDM), "Control of patient, contacts and the immediate environment".
See the Influenza section of the Red Book.

Refer to the Morbidity and Mortality Weekly Report (*MMWR*), Prevention and Control of Influenza: Recommendations of the Advisory committee on Immunization Practices (ACIP). (This is published annually in April at: http://www.cdc.gov/nip/publications/ACIP-list.htm

Note:
Notify area nursing homes and residential care facilities when a laboratory confirmed case of influenza is reported. This will allow them to prepare for an outbreak in the institution and reduce nosocomial transmission

Laboratory Procedures

Specimens:

- **For influenza virus isolation, the most common specimen is a simple throat swab. However, nasal wash or pharyngeal swabs and aspirates generally improve the quantity and the quality of the viral specimen submitted, leading to improved testing accuracy.** Viral culture testing is considered the gold standard and is performed at the SPHL. This avenue of testing is available during outbreaks and for Missouri physicians participating in the U.S. Influenza Sentinel Physician Surveillance Network. Viral culture testing may take up to 3 weeks for strain identification, therefore is not suitable for diagnosis in determining treatment options. **Viral cultures:** Respiratory specimens should be collected in the acute stage of the illness, kept moist, and refrigerated immediately. Whenever possible, specimens should be shipped so they will **not** arrive in the laboratory over the weekend. The specimen swab should be broken off into the medium and sent in the medium to the laboratory in the Styrofoam culture kit box and a **frozen** freeze pillow. (See the procedure to follow for submitting virus isolation specimens for influenza testing).
- Contact the Regional Communicable Disease Coordinator when viral culture testing is indicated for a facility or community outbreak. Viral specimens should be collected on patients within the first 4 days of illness. The ideal time for viral culturing is within the first three days of symptom onset.[4] Be sure to label the specimen with the date of collection and the patient's name.
- **Rapid Diagnostic Tests.** The sensitivity and specificity of these rapid tests is usually dependent on the type of test, the quality of specimen collected, and on the amount of virus collected in the specimen. Pharyngeal swabs and nasal washes or aspirates yield the best specimens, as these will contain more mucous and cellular material than a throat swab. Many of the rapid tests are done in physicians offices and are now on the CLIA waived test list.[5] Depending on the product, these tests can detect the presence of influenza A/B undifferentiated, influenza type A alone, or influenza type B alone in throat swabs or nasal wash specimens. The specimen must be collected early in the onset of the illness and contain sufficient cellar material and mucous to receive reliable results.
- **Blood**. Blood serology may be used for laboratory confirmation of influenza. If a unique or a new strain (subtype) of influenza virus is suspected, this method may prove valuable. The laboratory diagnosis will be based on a four-fold rise in antibody titer between the acute and convalescent specimens of serum. CDC laboratories do a limited number of specialized serology tests each year. **CALL** the Regional Communicable Disease Coordinator or the State Influenza Coordinator at the Section for Communicable Disease Prevention for direction before collecting serum specimens. The serum specimens must be sent as a pair, the containers marked with patient's name, and identified as acute or

convalescent. The SPHL will fill out two D.A.S.H. lab flow sheets (CDC 50.34) to send with these specimens.

- A single serum specimen will not be recognized.
- For questions regarding viral specimen collection, see attached "Procedure to Follow for Submitting Virus Isolation Specimens for Influenza Testing." This procedure is provided with each influenza viral culture kit mailed out by the SPHL

Reporting Requirements

Laboratory Confirmed Influenza is a Category II disease and shall be reported to the local health authority or the Missouri Department of Health and Senior Services within 3 days of identification.

1. For viral culture confirmed cases, complete a "DHSS Disease Case Report" form (CD-1). For positive rapid antigen tests, a laboratory report with a complete patient address will suffice.
2. Entry of the completed CD-1 into MOHSIS negates the need for the paper CD-1 to be forwarded to the Regional Health Office.
3. For school or child care closures / outbreaks complete the "Influenza Outbreak/School Closure Information form" and forward the completed document to the Regional Health Office or the State Influenza Coordinator.
4. For outbreaks in health care facilities, nursing homes, residential care facilities, or rehabilitation facilities, complete the "Influenza Investigation Report" and forward the completed document to the Regional Health Office or the State Influenza Coordinator.
5. An outbreak summary should be submitted within 90 days from the conclusion of the outbreak:
   - When the outbreak occurs in health care facilities, nursing homes, residential care facilities, rehabilitation facilities, or
   - When significant resources are applied by either the Local or State Health Department to intervene with the outbreak.
6. Submit the final outbreak summary to the Regional Communicable Disease Coordinator or the State Influenza Coordinator.

References

1. Chin, James, ed. "Influenza." Control of Communicable Diseases Manual. 17th ed. Washington, DC: American Public Health Association, 2000: 270-276.
2. American Academy of Pediatrics. "Influenza." In: Pickering, LK. & et al. ed. 2000 Red Book: Report of the Committee on Infectious Diseases. 25th ed. Elk Grove Village, IL. 2000: 351-359.
3. Centers for Disease Control and Prevention. Prevention and Control of Influenza. Recommendations of the Advisory Committee on

Immunization Practices (ACIP). MMWR April 25, 2003 / Vol. 52 (RR-08); 1-36.

4. Glezen, W. Paul and Robert B. Couch "Influenza Viruses." Viral Infections of Humans. Ed. Alfred S. Evans and Richard A. Kaslow. 4th ed. New York: Plenum, 1997: 473-496.
5. CLIA Waived Test List (By Specialty/Subspecialty), CAP Laboratory Improvement Publication, Updated October 23, 2001.
6. Missouri Department of Health and Senior Services State Public Health Laboratory: Procedure for submitting virus isolation specimens for influenza testing.

Other Sources of Information

Web Sites

1. Centers for Disease Control and Prevention, Flu Season. http://www.cdc.gov/nip/Flu/default.htm. (26 June2002)
2. Morbidity and Mortality Weekly Report (*MMWR*), "Prevention and Control of Influenza: Recommendations of the Advisory committee on Immunization Practices (ACIP)," 25 April 2003. http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5208a1.htm. (26 July 2003).
3. Centers for Disease Control and Prevention, Disease Information, "Influenza" http://www.cdc.gov/ncidod/diseases/flu/fluinfo.htm (26 July 2003)
4. Centers for Disease Control and Prevention, Influenza Branch, "Influenza Summary Update" http://www.cdc.gov/ncidod/diseases/flu/weekly.htm (22 May 2003).